



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

How far would it fall in, say, 9 seconds. Of course  $9^2 a$  or the sum of all the triangles in the first nine spaces.

With what velocity must a body be projected upward in order to rise during 10 seconds? Opposite 10 are 19 triangles so the initial velocity should be  $19a$ .

By a little thought any rule or problem in falling bodies can be *counted* out upon the diagram and it is unnecessary to commit any rule to memory as it can be produced at any moment from the diagram. Even the recollection will usually be sufficient to solve an ordinary problem as it has done with the inventor of the diagram—the writer—for thirty-five or forty years.

ERRATUM.—Owing to the extravagance of the compositor a needless *the* was inserted in the title of this paper.—PUBLISHERS.

---

## ARITHMETIC.

---

Conducted by B.F.FINKEL, Kidder, Missouri. All Contributions to this department should be sent to him.

---

### SOLUTIONS OF PROBLEMS.

---

38. Proposed by J. A. CALDERHEAD, B. Sc., Superintendent of Schools, Limaville, Ohio.

What must be the thickness of a 36-inch shell, in order that it may weigh 1 ton, supposing a 13-inch shell to weigh 200 pounds, when two inches thick.

IV. Solution by the PROPOSER.

$$200:2000::13^3-9^3:36^3-r^3; \text{ whence } r=31.74 \text{ inches.}$$

$$\therefore (36-31.74) \div 2 = 2.13 \text{ inches} = \text{thickness of 36-inch shell.}$$

39. Proposed by P. C. CULLEN, Superintendent of Schools, Brady, Nebraska.

*A*, *B*, and *C* start from same point at same time. *A* north at rate of three miles per hour, *B* east at rate of four miles and *C* west at rate of five miles per hour. *B* at end of two hours starts at such an angle as to intersect *A*. How long after starting must *C* start north-west in order to meet *A* and *B* at common point?

II. Solution by Professor H. W. DRAUGHON, Ohio, Mississippi.

While *B* travels 8 miles east, *A* travels 6 miles north. The rest of *A*'s distance north, and the distance *B* travels after turning, are in the ratio of 3 to 4. Since *B*'s latter distance is on the hypotenuse of a right triangle, whose base is 8 miles and perpendicular, *A*'s distance, we have from Geometry,  $(\text{hypotenuse} + 8)(\text{hypotenuse} - 8) = (\frac{3}{4}\text{hypotenuse} + 6)^2 = \frac{9}{16}(\text{hypotenuse} + 8)^2$ ; hence, by division, we get  $\text{hypotenuse} - 8 = \frac{9}{16}(\text{hypotenuse} + 8)$ .  $\therefore$  hypotenuse =  $28\frac{1}{4}$  miles; and the perpendicular, = *A*'s distance north,